

# Clinical Trial Protocol

## Iranian Registry of Clinical Trials

28 May 2026

### Comparison of Effectiveness of Hydroquinone 4% and Fractional CO2 Laser combination vs. Hydroquinone 4% Monotherapy in women from the age range of 20-50 years with melasma.

#### Protocol summary

##### Study aim

To evaluate the efficacy of fractional CO2 laser in combination with topical therapy in melasma treatment.

##### Design

A parallel group, single-blinded, blocked randomization clinical trial, design of 40 patients, enrolled between February 2015 and March 2016, and followed at three-week intervals and one and three months after the last laser session

##### Settings and conduct

Each side of the face was randomly allotted to either topical hydroquinone 4% or combination of topical hydroquinone 4% and Fractional CO2 laser. The patients received three sessions of laser therapy at 3-week intervals. They were asked to use hydroquinone 4% on both sides for 3 months after the last laser session during follow-up. The clinical improvement was measured by an impartial blinded physician.

##### Participants/Inclusion and exclusion criteria

Inclusion criteria: Female, age range of 20-50 years, Fitzpatrick skin types II-V, bilateral melasma. Exclusion criteria: history of receiving laser therapy and topical therapeutic agents in the previous three months, Isotretinoin in the past six months, OCP, other bleaching creams, phenytoin, phototoxic and photoallergic drugs, pregnancy and lactating.

##### Intervention groups

For each patient one cheek is considered as the control (Hydroquinone group) and the other cheek as the experiment (laser and Hydroquinone group).

##### Main outcome variables

Darkness of hyperpigmentations. Homogeneity of hyperpigmentations response to treatment due to the percentage improvement in the lesions. Patient's satisfaction with the treatment.

#### General information

##### Reason for update

##### Acronym

##### IRCT registration information

IRCT registration number: **IRCT20171222037987N1**

Registration date: **2018-06-30, 1397/04/09**

Registration timing: **retrospective**

Last update: **2018-06-30, 1397/04/09**

Update count: **0**

##### Registration date

2018-06-30, 1397/04/09

##### Registrant information

##### Name

Farahnaz Fatemi Naeini

##### Name of organization / entity

##### Country

Iran (Islamic Republic of)

##### Phone

+98 31 3668 4781

##### Email address

fatemi@med.mui.ac.ir

##### Recruitment status

**Recruitment complete**

##### Funding source

##### Expected recruitment start date

2015-02-04, 1393/11/15

##### Expected recruitment end date

2015-10-06, 1394/07/14

##### Actual recruitment start date

2015-02-04, 1393/11/15

##### Actual recruitment end date

2016-03-10, 1394/12/20

##### Trial completion date

empty

## Scientific title

Comparison of Effectiveness of Hydroquinone 4% and Fractional CO2 Laser combination vs. Hydroquinone 4% Monotherapy in women from the age range of 20-50 years with melasma.

## Public title

Combination of Hydroquinone and Fractional CO2 Laser vs. Hydroquinone Monotherapy in Melasma Treatment: A Randomized Split-face Clinical Trial

## Purpose

Treatment

## Inclusion/Exclusion criteria

### Inclusion criteria:

Female patients Age range of 20-50 years Fitzpatrick skin types II-V Bilateral melasma on cheeks

### Exclusion criteria:

History of receiving laser therapy and topical therapeutic agents in the previous three months History of receiving Isotretinoin in the past six months History of receiving OCP, other bleaching creams, phenytoin, phototoxic and photoallergic drugs Pregnancy Lactating

## Age

From **20 years** old to **50 years** old

## Gender

Female

## Phase

3

## Groups that have been masked

- Investigator
- Outcome assessor
- Data analyser

## Sample size

Target sample size: **40**

More than 1 sample in each individual

Number of samples in each individual: **2**

for each patient one cheek is considered as the control and the other cheek as the experiment

Actual sample size reached: **37**

More than 1 sample in each individual

Actual sample size in each individual: **2**

for each patient one cheek was considered as the control and the other cheek as the experiment

## Randomization (investigator's opinion)

Randomized

## Randomization description

For each patient one cheek was considered as the control (Hydroquinone group) and the other cheek as the experiment (laser and Hydroquinone group) according to blocked randomization which was generated by a third independent person who was not involved in the study. Participants were randomized in to group A (right cheek as the experiment) and group B (left cheek as the experiment) within then blocks of four each. Randomly generated treatment allocations were concealed in the forty envelopes which were sequentially numbered and opened only after each patient was consented to enter the trial.

## Blinding (investigator's opinion)

Single blinded

## Blinding description

the main investigators, data analysors and out come assessors were blinded. Severity of the melasma lesions was assessed objectively by the main investigator who was blinded to the treatment being given on each side and consultant dermatologist who was blinded to the type of treatments applied and aim of the study. Furthermore, response to treatment was evaluated subjectively by the main investigator and another consultant dermatologist who was blinded to the treatment being given on each side and the aim of the study.

## Placebo

Not used

## Assignment

Parallel

## Other design features

## Secondary Ids

empty

## Ethics committees

### 1

#### Ethics committee

##### Name of ethics committee

Ethics committee of Isfahan University of Medical Sciences

##### Street address

Isfahan University of Medical sciences, Hezar Jerib Ave

##### City

Isfahan

##### Province

Isfahan

##### Postal code

8174673461

#### Approval date

2013-01-20, 1391/11/01

#### Ethics committee reference number

391095

## Health conditions studied

### 1

#### Description of health condition studied

melasma

#### ICD-10 code

L81.1

#### ICD-10 code description

Chloasma

## Primary outcomes

### 1

#### Description

Severity of the melasma lesions was assessed objectively based on Darkness (D) and Homogeneity (H) using a 7-point scale (0-6).

### Timepoint

The darkness and homogeneity scores were obtained in the first visit and the 3 laser sessions at three-week intervals and the follow-up sessions at 1 and 3 months after the last laser session.

### Method of measurement

darkness and homogeneity : 7-point scale(compare with the sample) patient's satisfaction with the treatment :visual analogue scale (VAS) by scoring between 0 and 10 response to treatment : physician global assessment

## Secondary outcomes

### 1

#### Description

patient's satisfaction with the treatment.

#### Timepoint

3 months after the last laser session.

#### Method of measurement

visual analogue scale (VAS) by scoring between 0 and 10.

## Intervention groups

### 1

#### Description

Intervention group: for each patient one side of the face was randomly allotted to topical hydroquinone 4% and Fractional CO2 laser (combination therapy group). Patients received three sessions of laser therapy at 3-week intervals with the Dios instrument. (Laser fluence of 5 J/cm<sup>2</sup>, Dot cycle of 6 and Pixel pitch of 2).

#### Category

Treatment - Drugs

### 2

#### Description

Control group: for each patient one side of the face was randomly allotted to topical hydroquinone 4% (monotherapy group). Hydroquinone 4% was applied during the study and maintained for 3 months after the last laser session.

#### Category

Treatment - Drugs

## Recruitment centers

### 1

#### Recruitment center

##### Name of recruitment center

Alzahra Hospital

##### Full name of responsible person

Farahnaz Fatemi Naeini

##### Street address

Department of Dermatology, Alzahra Hospital , Soffeh Blvd, Isfahan

##### City

Isfahan

### Province

Isfahan

### Postal code

8174675731

### Phone

+98 31 3620 2087

### Email

fatemi@med.mui.ac.ir

### Web page address

<http://med.mui.ac.ir/?q=post/post>

## Sponsors / Funding sources

### 1

#### Sponsor

##### Name of organization / entity

Esfahan University of Medical Sciences

##### Full name of responsible person

Mansour Siavash

##### Street address

4th building, Isfahan University of Medical Sciences, Hezar Jerib Ave, Isfahan

##### City

Isfahan

##### Province

Isfahan

##### Postal code

7346181746

##### Phone

+98 31 3792 2252

##### Email

research@mui.ac.ir

##### Web page address

<http://research.mui.ac.ir/>

#### Grant name

#### Grant code / Reference number

#### Is the source of funding the same sponsor organization/entity?

Yes

#### Title of funding source

Esfahan University of Medical Sciences

#### Proportion provided by this source

100

#### Public or private sector

Public

#### Domestic or foreign origin

Domestic

#### Category of foreign source of funding

*empty*

#### Country of origin

#### Type of organization providing the funding

Academic

## Person responsible for general inquiries

#### Contact

##### Name of organization / entity

Esfahan University of Medical Sciences

##### Full name of responsible person

Farahnaz Fatemi Naeini

##### Position

Professor

**Latest degree**

Specialist

**Other areas of specialty/work**

Dermatology

**Street address**

Department of Dermatology, Alzahra Hospital, Soffe Blvd, Isfahan

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## Person responsible for scientific inquiries

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**Name of organization / entity**

Esfahan University of Medical Sciences

**Full name of responsible person**

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**Latest degree**

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## Sharing plan

**Deidentified Individual Participant Data Set (IPD)**

No - There is not a plan to make this available

**Justification/reason for indecision/not sharing IPD**

No further information

**Study Protocol**

No - There is not a plan to make this available

**Statistical Analysis Plan**

No - There is not a plan to make this available

**Informed Consent Form**

No - There is not a plan to make this available

**Clinical Study Report**

Undecided - It is not yet known if there will be a plan to make this available

**Analytic Code**

No - There is not a plan to make this available

**Data Dictionary**

No - There is not a plan to make this available